CLAIMS

1. A therapeutic treatment device comprising an incoherent light source operable to provide a pulsed light output for treatment.

2. The treatment device of claim 1 further comprising a housing with an opening, said light source being disposed in said housing, and said housing being suitable for being disposed adjacent a skin treatment area.

3. The treatment device of claim 2 further comprising a variable pulse width pulse forming circuit electrically connected to said light source.

4. The treatment device of claim 3 wherein said variable pulse width pulse forming circuit comprises a plurality of pulse forming networks.

5. The treatment device of claim 3 further comprising a reflector mounted within said housing and proximate said light source.

6. The treatment device of claim 5 further comprising at least one optical filter mounted proximate said opening.

7. The treatment device of claim 6 further comprising an iris mounted about said opening.

8. The treatment device of claim 7 including means for providing controlled energy density, filtered,

pulsed light output through said opening and said iris to a skin area for treatment.

9. The device of claim 8 wherein said light source is a flashlamp.

10. The device of claim 3 wherein said variable pulse-width pulse forming circuit includes means for selecting a pulse width effective for a treatment of a disorder in the immediate vicinity of the skin.

11. The device of claim 9 wherein said light source comprises means for providing pulses having a width in the range of between substantially 0.5 and 10 microsec and an energy density of the light on the skin of up to about 10J/cm^2, whereby the light ~~ablates~~ TREATS external disorders of the skin, SUCH AS: TATTOOS, PIGMENTED LESIONS OR BIRTH AND AGE MARKS.

12. The device of any of claims 9 wherein said light source comprises means for providing a pulse in the range of about 0.5msec to 100msec, whereby blood vessels proximate the skin may be coagulated.

13. The device of claim 9 wherein said at least one filter includes means for providing a light spectrum having a significant portion of its energy in the wavelength range of substantially 550 to 650nm.

14. The device of claim 9 wherein said at least one filter includes means for providing a light spectrum having a significant portion of the energy in the wavelength range substantially greater than 650nm.

15. The device of claim 9 wherein said light source further comprises a fluorescent material disposed about said flash lamp, said fluorescent material being of the type that absorbs radiation emitted by said flashlamp and emits radiation in a range effective for skin thermolysis and coagulation of blood vessels in the skin and immediately thereunder, wherein said optical filters are of the type that absorb radiation in the wavelength range of substantially less than 500nm.

16. The device of claim 5 wherein said reflector has a reflectivity which varies as a function of wavelength.

17. The device of claim 9 further comprising means for changing the current density in said flashlamp.

18. The device of claim 9 further comprising a power supply connected to and external of said housing, wherein said housing includes a handle.

19. A method of treatment with light energy comprising the steps of:

providing a pulsed light output from a non-laser, incoherent light source; and

directing said pulsed light output to a treatment area.

20. The method of claim 19 further comprising the steps of:

controlling the pulse-width of said pulsed light output;

focusing said light source for controlling the power density of said pulsed light output; and

filtering and controlling the spectrum of said pulsed light output.

21. The method of claim 20 wherein the step of directing includes the step of directing said pulsed light to blood vessels in the vicinity of the skin.

22. The method of claim 20 wherein the step of directing includes the step of directing said pulsed light to skin irregularities.

23. The method of claim 20 wherein said pulse-width controlling step achieves effective treatment of a disorder of the skin.

24. The method of claim 21 wherein said step of controlling the pulse width includes the step of providing a pulse width in the range of about 0.5-10 microsec with energy density of the light on the skin on the order of about $10J/cm^2$, whereby the skin is treated.

25. The method of claim 22 wherein said step of controlling the pulse width includes the step of providing a pulse width in the range of substantially 0.5msec to 100msec, whereby blood vessels ~~in the skin~~ are coagulated.

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26. The method of claim 21 wherein the step of filtering and controlling the spectrum includes the step of providing a spectrum substantially in the wavelength range of 550 to 650nm.

27. The method of claim 22 wherein the step of filtering and controlling the spectrum includes the step of providing a spectrum substantially in the wavelength range of greater than 650nm.

28. The method of claim 20 further including the steps of:

providing a fluorescent material surrounding the light source;

absorbing radiation in the fluorescent material, said radiation being emitted by said light source;

emitting radiation from the fluorescent material, the radiation having a wavelength in the range of substantially 550 to 650nm; and

absorbing radiation in the wavelength range substantially less than 500nm.

29. A system for providing pulsed light comprising;

a pulsed toroidal flash tube incoherent light source;

a reflector disposed about said incoherent light source, said reflector having a cross-section of substantially an ellipse, in a plane perpendicular to the minor axis of the toroidal flash tube; and

at least one optical fiber having an end disposed within said reflector.

30. The system of claim 29 wherein the major axis of the ellipse forms a small angle with the major axis of the toroidal flash tube.

31. The system of claim 29 wherein the reflector is filled with a fluid.

32. The system of claim 29 wherein said reflector is comprised of polished aluminum.

33. The system of claim 29 wherein the end of the optical fiber has a cone shape.

34. The system of claim 29 wherein the optical fiber is air clad.

35. The system of claim 29 wherein the end of the optical fiber is flat.

36. The system of claim 29 further comprising:

a plurality of optical fibers, each having an end disposed within the reflector; and

a linear to circular fiber transfer unit disposed to receive light from the light source and provide light to the optical fibers.

37. The system of claim 36 wherein the reflector has an elliptical cross-section in a plane parallel to the axis of the linear flash tube, and wherein the linear flash tube is located at one focus of the ellipse while the linear to circular transfer unit is located at the other focus of the ellipse.

38. A system for the treatment of skin disorders coupler comprising;

a pulsed toroidal flash tube incoherent light source;

a reflector disposed about said incoherent light source, said reflector having a cross-section of substantially an ellipse, in a plane perpendicular to the minor axis of the toroidal flash tube; and

at least one optical fiber having a first end disposed within said reflector, and having a second end capable of being disposed near a skin treatment area.

39. A system for invasive therapeutic application of pulsed light comprising;

a pulsed toroidal flash tube incoherent light source;

a reflector disposed about said incoherent light source, said reflector having a cross-section of substantially an ellipse, in a plane perpendicular to the minor axis of the toroidal flash tube; and

at least one optical fiber having a first end disposed within said reflector, and having a second end capable of being inserted into a body in the immediate vicinity of an organ for treatment.

40. A system for providing pulsed light for material processing comprising;

a pulsed toroidal flash tube incoherent light source;

a reflector disposed about said incoherent light source, said reflector having a cross-section of substantially an ellipse, in a plane perpendicular to the minor axis of the toroidal flash tube; and

at least one optical fiber having a first end disposed within said reflector, and having a second end capable of being disposed near a material being processed.

41. A system for providing pulsed light for photography comprising;

a pulsed toroidal flash tube incoherent light source;

a reflector disposed about said incoherent light source, said reflector having a cross-section of substantially an ellipse, in a plane perpendicular to the minor axis of the toroidal flash tube; and

at least one optical fiber having a first end disposed within said reflector, and having a second end capable of being disposed near ~~a film treatment~~ THE area BEING PHOTOGRAPHED

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42. A system for the treatment of skin disorders coupler comprising;

a pulsed toroidal flash tube incoherent light source;

a reflector disposed about said incoherent light source, said reflector having a cross-section of substantially an ellipse, in a plane perpendicular to the minor axis of the toroidal flash tube; and

at least one optical fiber having a first end disposed within said reflector, and having a second end capable of being disposed near a skin treatment area.

43. A system for providing pulsed light comprising a pulsed ~~flash~~ tube incoherent light source and an optical fiber wound about the flashtube.

44. The system of claim 42 wherein said optical fiber is doped with a fluorescent material.

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